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(54) **Bar-storage apparatus.**

(57) The invention relates to a bar storage apparatus (1) for storing bars (B) to be supplied to a bar processing machine (3) such as a sawing machine.

According to the invention, the bar storage apparatus (1) comprises a shelf frame (19) provided with a plurality of pallet accommodating shelves (17), each of these shelves (17) being provided for movably accommodating a pallet (15) on which a plurality of bars (B) are mounted.

The bar storage apparatus (1) further comprises an elevator device (23) disposed on one side of the shelf frame (19) and provided with a traverser (21) for moving each pallet (15) into and from each of the pallet accommodating shelves (17).

The bar storage apparatus (1) comprises in addition a bar supplying device (25) for supplying a bar (B) to the bar processing machine (3).

The invention also relates to a method for loading a bar from a storage apparatus (1) to a bar processing machine (3).

According to the invention, the method comprises the steps of mounting a plurality of bars (B) on a pallet (15), selectively taking up a desired bar (B) and passing the bar (B) taken up to a bar feeding device.

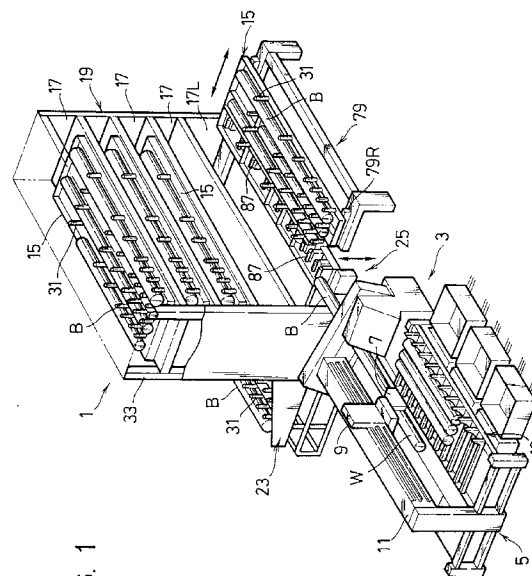


FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 93 40 1463

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
D,X Y A	US-A-4 362 454 (KRIPZAK) * figures 1-4 *	1,2 3 14	B65G1/04 B23Q7/04 B26D7/06
D,X Y	DE-A-40 18 139 (AMADA CO. LTD.) * figures 2,3 *	1,2 3	
P,D, X	WO-A-92 12915 (AMADA COMPANY LIMITED) * the whole document *	1,2	
Y	WO-A-89 05709 (RUMPLER) * figures 1,2,27,29,30 *	3	
A		5	
A	EP-A-0 206 992 (SIEBER) * figures 1,6 *	5	
A	EP-A-0 195 844 (LISTA AG) * figures 1,5 *	13,14	
A	EP-A-0 281 955 (DORNIEDEN) * figures 3,4 *	13,14	TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A	US-A-4 077 532 (BRYAN) * column 5, line 16 - line 39; figures 2,5,7C *	13	B23Q B65G B26D
A	US-A-4 642 014 (SAARINEN) * claim 9 *	13	
A	US-A-3 426 922 (MASSEY) * figure 12 *	13	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 May 1994	Examiner Carmichael, Guy
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 01.82 (P04C01)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet -B-

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims: 1-3, 5, 13, 14
- ☐ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-3
2. Claim 4
3. Claims 5,13,14
4. Claim 6
5. Claims 7-9,12
6. Claims 10-12,16
7. Claims 15,17

see attached sheets

Lack of Unity, Article 82 EPC.

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The subject-matter of claim 1 is already known. The requisite unity of invention therefore no longer exists inasmuch as the subject-matters of the dependent claims 4, 5, 6, 7, 10, 13 and 15, even when considering the description, are no longer linked with the subject-matter of dependent claims 2 and 3 by a common inventive concept. Furthermore independent claim 17, which represents a method of use of the apparatus which forms the subject-matter of dependent claim 15, is also not linked with the subject-matter of claims 2 and 3.

Document US-A- 4 362 454 discloses a bar storage apparatus comprising a shelf frame (11) provided with a plurality of pallet accommodating shelves (14) each for movably accommodating a pallet (15) on which a plurality of bars (W) are mounted; an elevator device (20) disposed on one side of said shelf frame (11) so as to be movable up and down and provided with a traverser (28) for moving each pallet (15) into and from each of the pallet accommodating shelves (14); and a bar supplying device (2) for supplying a bar (W), mounted on the pallet (15) moved from the pallet accommodating shelf (14) and located at a predetermined position (column 2, lines 59 to 62) by said elevator device, to a bar processing machine (1). Since all the features of independent claim 1 are known from this document, the subject-matter of independent claim 1 is not new.

The dependent claims, when they depend directly from claim 1, must now be considered as separate independent claims containing all of the features of claim 1. To be

considered as forming unity according to Article 82 EPC, these claims should exhibit a technical relationship involving one or more of the same or corresponding technical features, Rule 30(1) EPC. In this application however, this is not the case, with the following different inventions being seen to exist:

1. Claims 2 and 3. The subject-matter of these claims relates to the supply of the bar, using one unit only to supply and feed the bar to the machine for processing. This subject-matter is however known from the prior art, see Search Report.

2. Claim 4. The subject-matter of this claim, when dependent from claim 1, relates to a particular type of feed roller designed for the feeding of bars, which seeks to stably support a bar in a central position, irrespective of its diameter.

3. Claims 5, 13 and 14. The subject-matter of these claims, when dependent from claim 1, relates to the design of a pallet suitable for use in a bar-storage apparatus.

4. Claim 6. The subject-matter of claim 6, when dependent from claim 1, relates to the provision of a support table on the opposite side of the storage shelves from the elevator device.

5. Claims 7 to 9 and 12 (when dependent from claims 7 or 8). The subject-matter of these claims relates to the supply of a bar wherein the supplying and feeding stages are performed by two different units.

6. Claims 10 to 12 (when dependent from claims 10 or 11) and 16. The subject-matter of these claims relates to the supply of a bar wherein the supplying and feeding stages are separated by a conveying stage, the apparatus employing three different units for these stages.

7. Claims 15 and 17. The subject-matter of these claims relates to an apparatus and its method of use which enables bars, which are mounted in series on the pallet, to be selectively taken from the pallet. As stated in the description (page 25, line 38 onwards), this represents only an option for the embodiments of the invention of figures 11 to 16 and cannot be applied to the previous embodiments.

These different inventions appear, when considered separately, not to share either a common problem or a common technical feature which would define a contribution over the prior art. As such the different inventions do not satisfy the requirements of unity of invention, Article 82 EPC.